PERIPHERAL GIANT CELL GRANULOMA: A CASE REPORT

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Aim: peripheral giant cell granuloma (PGCG) or giant cell tumor (GCT), is a tumor-like lesion arising on the mucosa of the adherent vestibular or lingual gingiva, or edentulous alveolar ridge mucosa. It is a rather frequent lesion but it is often underdiagnosed because it is mistaken for pyogenic granuloma. The aim of this work is to present a case of peripheral giant cell granuloma and its surgical laser excision.

Methods: a 62-year-old female patient of Dominican origin came to the Oral Medicine and Pathology unit of the U.O.C of Odontostomatology and Maxillofacial Surgery of Ospedale Maggiore Policlinico Fondazione IRCCS Ca' Granda in Milan for clinical follow-up and evaluation of oral conditions. Physical examination revealed suspected pyogenic granuloma with dimensions of about 10-14 mm in diameter in 2.1-2.2 area. Primary diagnosis is gingival hypertrophy associated with gingival epulis.

Results: the patient underwent laser-assisted excisional biopsy of and subsequent histopathological analysis, which reported a diagnosis compatible with peripheral giant cell granuloma. A radiological check-up with orthopantomography and Cone Beam CT was required to assess any recurrence of the lesion and to evaluate the surgical site.

Conclusions: laser-assisted excisional biopsy has been shown to be effective in excising the lesion. Diagnostic images show no evidence of recurrence of the lesion.

Collaboration with the anatomic pathologist is suggested to get a correct diagnosis and set up an appropriate treatment plan.

PROLIFERATIVE VERROUCOUS LEUKOPLAKIA AND LASER-ASSISTED EXCISION: A CASE REPORT

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Aim: proliferative verroucous leukoplakia (PVL) is a particularly aggressive and potentially malignant disorder, characterized by a marked tendency to neoplastic transformation. It is defined as a white plaque that cannot be characterized neither from a clinical point of view nor from a histological point of view. The incidence of the disease is about 3% and the malignant potential is estimated to be between 4% and 17%. The aim of this work is to present a case of PVL and its surgical treatment by laser-assisted excision.

Methods: a 54-year-old female patient came to the Oral Medicine and Pathology unit of the U.O.C of Odontostomatology and Maxillofacial Surgery of Ospedale Maggiore Policlinico Fondazione IRCCS Ca' Granda in Milan for clinical follow-up and evaluation of oral conditions. Physical examination revealed PVL with dimensions of about 3 cm in diameter in posterior palatal area. A previous biopsy and histological diagnosis had already confirmed the suspect of PVL.

Results: the patient underwent laser-assisted excisional surgery to remove the palatal lesion. A histopathological analysis was performed in order to exclude the presence of displasy.

Conclusions: laser-assisted excisional biopsy has been shown to be effective in excising the lesion, but it's not effective in prevent the recurrency. Infact the patient has shown the recurrence of another lesion, but in a different area. It could be considered a valid method for treating extensive lesions with minimal invasiveness and patient discomfort.

Doi: 10.19256/abstract.cduo.07.2022

SCLERODERMA AND DIODE LASER TREATMENT: A CASE REPORT

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Aim: scleroderma is a chronic, generalized disorder of the connective tissue. It is characterized by immune disorders, abnormalities of morphology and functions of small blood vessels, and the presence of inflammatory process. The oral cavity may be the place of pathological manifestations within soft and hard tissues. The oral abnormalities that are frequently reported in scleroderma are: xerostomia, microstomy, increased risk of periodontal disease, mandibular resorption, trigeminal neuropathy and telangectasia of the face and mucous membranes.

Methods: an Italian 54-year-old patient shows up at the surgery of Oral Medicine and Pathology of the U.O.C. of Odontostomatology and Maxillofacial Surgery of the Ospedale Maggiore Policlinico Fondazione IRCCS Ca' Granda in Milan for the evaluation of vascular lesions to the upper and inferior lips. The patient reports bleeding of certain injuries and diagnosis of scleroderma of the attending physician. On the physical examination it has point lesions with a maximum diameter of 3mm, the oral mucous membranes are moderately hyperemic and normal blood flow was present.

Results: after the application of Luan 2% topical anesthesia, the patient underwent surgical cauterization of the lesions through the use of diode laser.

Conclusions: the patient shows no signs of relapse nor spontaneous bleeding and good healing of the treated site is noted. Laser assisted cauterization could be an effective approach to treat oral vascular lesions, with minimum discomfort for patients during recovery.

LOW LEVEL LASER THERAPY AND PRGF EFFICACY IN THIRD MOLAR EXTRACTION: PRELIMINARY RESULTS

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Aim: the aim of this study is to test the efficacy of the Low-Level Laser Therapy (LLLT) and Plasma Rich in Grow Factors (PRGF) in reducing post operative complications (oedema, trismus, pain) after the extraction of an impacted inferior third molar.

Methods: data regarding pain were assessed through the Visual Analogue Scale and the Mc Gill Pain Questionnaire Short Form while measures regarding trismus and oedema were carried out with a gauge measuring tool. Data were recorded at five time points: before surgery (T0), right after surgery (T1), at 48 hours (T2), at 7 days (T3) and at 15 days (T4). Patients were randomly divided in four groups: in the first group patients were treated with LLLT session and PRGF, in the second group patients received only PRGF, in the third group patients underwent only LLLT and the fourth group were control patients.

Results: preliminary results regarding 40 patients show that those who received both PRGF and laser application experienced on average less pain, reduced oedema and trismus at T2 and T3 compared to the other groups ($p < 0.05$). Moreover, group 2 and 3 showed better results in the three analyzed variables compared to the placebo group even though not statistically significant.

Conclusions: the use of LLLT and PRGF can be a useful tool in inferior third molar extractions in order to reduce post operative complications. More data regarding a larger sample size will be needed to confirm these results.

PAIN IN FIXED ORTHODONTIC TREATMENT. ROLE OF PHOTOBIOMODULATION: DREAM OR REALITY?

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Pain is an unpleasant emotional and sensory experience. For many years orthodontists have been looking for an effective method of reducing this feeling of discomfort. In recent years, Photobiomodulation (PBM) has taken hold in the orthodontic field. Among the countless advantages it can modulate the painful feeling. The aim of this research is to identify the use of photobiomodulation in subjects undergoing fixed orthodontic treatment, to reduce the pain and discomfort that it causes. The research was conducted from the Web of Science, Pubmed and Scopus databases. Only 14 of all articles met the inclusion and exclusion criteria and were therefore used to conduct the research. The different studies compared, in most cases, patients whose mouth was divided into a part treated with laser therapy and a placebo part. The results show a statistically significant difference in perceived pain between the irradiated arch and the non-irradiated arch. Three authors didn't find statistically significant results in favour of Photobiomodulation, but it is important to remember that they used different parameters. To obtain generally valid studies, with consistent and reproducible results, it is necessary to standardize the different parameters used that are independent by operator performing the procedure.

LASER-ASSISTED TREATMENT OF MRONJ: COMBINATION OF ER:YG LASER AND OZONE THERAPY

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Aim: the purpose of this study is to evaluate the efficacy of the combination of ozone gel and Er: YAG laser in the treatment of drug-induced osteonecrosis of the jaws (MRONJ).
Methods: 7 patients with MRONJ of stages I, II and III were treated with a protocol that provides home and hospital medical therapy (Tm) + ozone therapy + surgical treatment with the Er: YAG laser. The protocol provides for a specific organization chart: Initially, medical therapy (TM) is performed; 8 applications of ozone gel once a week; Er: YAG laser surgery session; monitoring of healing for at least 12 months. Medical therapy (TM) includes: Hospital dressings of osteonecrotic lesions every 7 days: irrigation with physiological solution and application of 0.8% hydrogen peroxide gel for 15 minutes; Homemade dressings: patient also irrigated the wound with saline every 12h at the end of each meal. 0.8% hydrogen peroxide gel was applied for 15 minutes once a day; Antibiotics: administered in cases of perilesional soft tissue superinfection with suppuration and pain symptoms. The recommended antibiotic therapy is: amoxicillin clavulanate 1 gr every 12 hours + metronidazole 250 mg every 8h, for 7 days in case of exclusive medical treatment and 14, with surgery on the seventh day, in case of combined treatment. Patients were reassessed weekly for the first month, monthly for the following semester then every 3 months until the year. The radiographic survey was carried out 6 and 12 months after the last treatment.
Results: TM + Ozone therapy + Er: YAG laser surgery: all treated patients achieved complete clinical and radiographic recovery (100%) with complete remission of osteonecrosis.
Conclusions: the proposed combined treatment allows to obtain excellent results in the resolution of MRONJ. This success is explained by a series of characteristics specific to laser technology, in fact, thanks to the photoacoustic, photochemical, photothermal and photomechanical properties, the laser makes it possible to reduce the bacterial load at the intervention site.

RECURRENT LEUKOPLAKIA SUCCESSFULLY TREATED WITH DIODE LASER: A CASE REPORT

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Aim: oral leukoplakia is a white plaque lesion, classified as potentially malignant disorder. Approximately 1% of leukoplakias will transform into carcinoma every year. Management can be challenging as some leukoplakias will recur, irrespectively from treatment approach adopted. Diode laser has a wavelength of 810-980 nm and it has affinity for melanin and hemoglobin. Some advantages of laser use are promotion of a faster wound healing, reduction of bleeding, less traumatization, minimal invasiveness and ease of use. Here we report a case of recurrent leukoplakia successfully treated with diode laser.

Methods: a 70-year-old male was referred to the Department of Oral Surgery and Medicine of the University of Parma for a white plaque lesion of about 1.0 cm, with homogeneous color and surface, regular margins, asymptomatic and not ulcerated, on inferior surface of the tongue.

Results: surgical excision with scalpel was performed maintaining 0.5 cm resection margins, followed by histopathological examination, which excluded known white diseases. A definitive diagnosis of leukoplakia with mild dysplasia was rendered. At a 5-month follow-up visit, 2 small white lesions, compatible with recurrences, were identified in the same subsite. Surgical excision of such recurrences was performed with diode laser. Histopathological examination confirmed absence of dysplasia. At a 12-months follow-up no further lesions were identified.

Conclusions: diode laser is probably one of the most useful tools in soft tissue surgery. Lasers allow to safely perform surgery in highly vascularized sites, such as inferior surface of the tongue and oral pelvis, drastically reducing risk of bleeding. Recent evidence suggests that recurrence rate of leukoplakia is somewhat lower after laser excision.

ANTIMICROBIC EFFECT OF ER:YAG LASER ON CARIOUS LESIONS COMPARED TO TRADITIONAL THERAPY

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Aim: this study aimed to evaluate Erbium:Yttrio-Aluminum-Granate (Er:YAG) laser photothermal and mechanical effects on the composition of the microbial load and on the concentration of cariogenic species in treatment cavities to compare the reduction of microorganisms with conventional treatments.

Methods: adult patients with deep carious lesions of Black class I on permanent teeth were enrolled and randomized into the “control” and “intervention” groups and treated with manual and rotating conventional therapy (dentin spoon, turbine and drill handpiece) and Er:YAG, respectively. Two samples were collected from each patient in both groups using a sterile microbrush wiped on the cavity dentinal tissue before and after the treatments. The percentage of microbial reduction and the resulting colony forming units (CFU) after laser and conventional therapies were compared for total microorganisms, including Candida spp., Streptococcus spp. and Lactobacillus spp. Microbial typing was performed by sterile sampling of the isolated colonies, setting up a pure culture analyzed by mass spectrometry with MALDI TOF technology.

Results: the microbial reduction was significant for total microorganisms and Streptococcus spp. ($p < 0.05$) and ranged from 90.2% to 100%.

Conclusions: the Er:YAG laser reveals a promising future for clinical applications in conservative dentistry, in particular with “special needs”, non-collaborative and pediatric patients, due to its minimally invasive nature and effect on reducing the overall microbial load.

PHOTODYNAMIC THERAPY BASED ON NEW 5-ALA GEL AND 630NM-LED PROMOTES OSTEOGENIC EFFECTS

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Aim: the strong antimicrobial effects of new gel 5% delta-aminolevulinic acid (ALAD) associated with 630nm-LED as photodynamic therapy (ALAD-PDT) in treating periodontitis and peri-implantitis drove us to explore its potential regenerative effect on bone tissue by testing this new ALAD-PDT on primary human oral osteoblasts (hOBs).

Methods: the hOBs, explanted from human mandible bone fragments, were cultured, and incubated with ALAD gel for 45 minutes and subsequently irradiated with a 630nm-LED for 7 minutes (ALAD-PDT). To determine the time-dependent effects of ALAD-PDT treatment, the following points were evaluated: (1) cellular accumulation of the photosynthesize PpIX by 0.5M $HClO_4$, after 0, 48 and 72 h; (2) proliferation by MTT assay, after 48 and 72 h; (3) Alkaline Phosphatase (ALP) activity after 3 days; (4) calcium deposition by Alizarin Red Staining, and by Cetylpyridinium Chloride, after 14gg. Cells exposed to LED as positive control. Untreated and unexposed cells as negative control.

Results: the results showed significant accumulation of PpIX immediately after 45 min of incubation (0h), but this did not increase at 48 h and 72 h. Interestingly, these same time-points were associated with a significant enhancement of hOBs proliferation, with an increase of 46.83% and 127.75%, respectively. Furthermore, the ALP activity resulted stimulated and there was a significant increase in calcium deposition of 72.33%.

Conclusions: in conclusion, our data, for the first time, highlighted the osteoinductive effects of 5-aminolevulinic acid on human oral osteoblasts.

ORAL VASCULAR LESION TREATED WITH DIODE LASER PHOTOCOAGULATION: A 18 MONTHS FOLLOW UP

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Aim: vascular lesions such as neoformations accounts for 7% of all benign tumors. The oral cavity is the most frequent site, accounting for 14% all cases. Capillary and cavernous hemangiomas are the most frequent variants. Treatment options include topical beta blockers, oral propranolol, or steroid injections. Surgical excision and laser therapies may be necessary to optimize long term outcomes. The aim of this work is to report a case of vascular lesion of the buccal mucosa of the upper lip treated with Diode lasers by photocoagulation without complications and relapses.

Methods: a 38-year-old patient went to our observation for a dark-blue lesion on the upper lip mucosa. Anamnesis was positive for cholecystectomy, hysteroscopy, removal of a thyroid carcinoma, uterine myomas and tachycardia. She takes Levotiroxine (125 mg). After positive diascopy, a diagnosis of possible capillary hemangioma was made. We had decided to avoid invasive treatments, given the very aesthetic location and to use diode laser to treat this lesion through photothermo coagulation. After local anesthetic injection (mepivacaine without vasoconstrictor), diode laser 980 nm with power of 7 Watts, in pulsed mode, with a 300 µm optical fiber was activated, at a distance of 0.5 cm from the lesion surface, for a total of 2 minutes of irradiation.

Results: at two weeks after laser-assisted treatment, good tissue healing was evident with no edema and bleeding. No recurrence of the lesion occurred at the 6-month follow-up and healing was stable at 18 months.

Conclusions: in conclusion it can be stated that the minimally invasive treatment of photothermo coagulation with diode laser, was stable in the results, obtaining a quick and painless recovery for the patient. Surgery is not recommended because damage to these structures and formation of fistulas, infections and dehiscence of wounds and scars can occur in a highly aesthetic area.

LASER THERAPY OF OROPHARYNGEAL VENOUS MALFORMATIONS: A SYSTEMATIC REVIEW

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Aim: the use of laser therapy (LT) has been recently proposed as an alternative approach in the treatment of Venous Malformations (VMs), which represent the most common vascular malformations in oropharyngeal region (1-4%). The aim of this systematic review was to analyze the effectiveness of the LT used for treating oropharyngeal VMs.

Methods: a systematic review was carried out following the PRISMA guidelines. Searches were accomplished in 5 databases (Medline, Scopus, Embase, Cochrane Library, Web of Science) until 15/01/2022. Data on type of laser machines, protocols, clinical characteristics of the VMs, and outcomes were collected. Due to the heterogeneity of the studies, a qualitative analysis was performed.

Results: out of 759 articles, 14 studies were finally included. Nd:YAG laser was the most used (9 studies), followed by Diode laser (3 studies). CO2 and KTP laser were used respectively in 2 and 1 study. Almost all treated lesions had a reduction in volume > 75%. The mean of LT applications was 2.2 for the Nd:YAG laser, 3.1 for the Diode laser and 1 for both CO2 and KTP lasers. No major complications had been reported.

Conclusions: tMs of the head-neck region. Notably, the minimal invasiveness and the absence of major complications made the LT safe and potentially more tolerable than the conventional treatments.

PAIN MANAGEMENT AFTER THIRD MOLAR SURGERY USING 980NM LASER: A REVIEW

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Aim: the surgical extraction of the lower third molar is widely practiced in oral surgery and pain is a common postoperative sequela in the patients. Several methods have been used to reduce this postoperative complication, including the use of corticosteroids, nonsteroidal anti-inflammatory drugs, analgesics, antibiotics, less traumatic surgical methods, and the use of photobiomodulation. The aim of this narrative review is to summarize the current evidence on the effect of PBM with 980nm laser on pain after third molar surgery.

Methods: a literature search using MEDLINE (NCBI PubMed and PMC), EMBASE, Scopus, Cochrane library, Web of Science, and Google Scholar was undertaken up to February 2022. Inclusion criteria were (1) studies in the English language; (2) studies involving humans; (3) studies with primary outcomes including pain, swelling, and trismus; and (4) studies in which were used 980nm laser and the laser parameters were clearly stated. Exclusion criteria were (1) conference proceedings, letters to the editor, short communications; (2) *in vitro* or *in vivo* animal studies; and (3) studies with less than ten subjects.

Results: nine articles met the inclusion criteria. Eight studies reported a reduction of pain when compared to placebo or drug therapy, one study reported no statistically significant difference of PBM on reducing pain in comparison with placebo.

Conclusions: photobiomodulation with 980nm laser can be considered an alternative and useful method in order to control pain following impacted wisdom tooth surgery.

ORAL MUCOSITIS AND PHOTOBIOMODULATION: BETTER TO PREVENT OR TREAT?

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Aim: oral mucositis (OM) is one of the most debilitating side effects related to autologous hematopoietic stem cell transplantation (AHSCT), in particular during the conditioning chemotherapy regimen. Photobiomodulation (PBM) is recognized as a supportive therapy for reduction of local inflammation and pain.
Methods: our study is aimed at the prevention of the occurrence of OM in patients undergoing conditioning chemotherapy for AHSCT. The protocol provides daily PBM therapy sessions from the first day of conditioning up to two days after the replanting. A diode laser device was used with a specific protocol, according to the most recent literature evidences. In addition, we compared the clinical course of OM in this patients' cohort with a control group that underwent PBM therapy at the onset of OM.
Results: among 111 patients undergoing AHSCT, 9 subjects (8.11%) were treated with preventive PBM. OM was diagnosed in 55.86% of subjects, whereas patients with treated with preventive PBM developed significantly lower grade of OM (WHO scale, $p = 0.0002$) and pain scores (NRS scale, $p = 0.0077$) maintaining a better ability in swallowing, chewing and speaking.
Conclusions: PBM represents an effective therapeutic strategy not only in the management, but even in the prevention of OM, able to improve the quality of life of AHSCT patients. One of the main aims of this study is also to promote collaboration between specialists of oral medicine and hematology, in such a way as to introduce standard protocols to prevent OM, as encouraged by the most recent international guidelines for supportive care.

TREATMENT OF PERIODONTAL AND PERI-IMPLANT DEFECTS WITH LASER: A CASE SERIES

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Aim: to demonstrate that the use of diode and erbium Er:YAG laser in the removal of the granulation tissue, in periodontal and peri-implant defects, reduces surgical time, reduces bleeding, increases patient's comfort and enhances wound healing.
Methods: a case series of periodontal and peri-implant defects treated with laser for granulation tissue removal in addition to manual curettage.
Results: clinicians assessed the usefulness of diode and erbium laser use in terms of operative time, bleeding reduction and patient comfort compared with manual curettage.
Conclusions: the use of diode and erbium laser is an effective additional tool in the removal of granulation tissue in periodontal and peri-implant defects.

IS LASER LINGUAL FRENOTOMY PAINLESS IN NEWBORNS? A RETROSPECTIVE STUDY

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Aim: many authors depict laser lingual frenotomy in newborns as a painless intervention, but only a few measured such pain. The current study aims to provide an estimation of pain felt by newborns during laser lingual frenotomy by using a validated tool.

Methods: the authors conducted a retrospective study by analyzing the video records of laser lingual frenotomies performed in newborns with ankyloglossia causing breastfeeding difficulties from October 2021 to February 2022. Before surgery, all newborns received topic anesthesia by lidocaine 2,5% + prilocaine 2,5% cream. Diode laser frenotomy was performed by using a power of 4.5 W in continuous wave mode and external cooling by an icing tip. Observations about crying, oxygen saturation, heart rate, facial expression, and degree of sleepiness were combined and converted into pain scores according to C.R.I.E.S. scale's criteria (range 0-10 points); in addition, the last of each surgery was recorded too.

Results: 15 newborns (8 males, 7 females; 2.0 ± 0.8 months of age) underwent laser lingual frenotomy within the study period. During surgery: all newborns were awake and had an oxygen saturation of over 95%; 6 newborns had a heart rate increment > 20%. The intraoperative mean pain score was 5.8 ± 1.1 points, whereas the mean last of surgery was 2.7 ± 1.2 minutes.

Conclusions: the current results showed that laser lingual frenotomy caused moderate pain in newborns despite the use of topic anesthetic. Further efforts are ethically necessary to find optimal anesthesia for newborns.

TRANSMUCOSAL AND INTRALESIONAL LASER IN VOLUMINOUS INTRA- AND EXTRA-ORAL VASCULAR DISEASES

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Aim: the 2018 ISSVA classification for vascular anomalies (VAs) divides them into vascular tumors and vascular malformations; the latter can be single or multiple (syndromic or not). This study aims to describe a transmucosal and intralesional laser treatment for voluminous intra- and extra-oral VAs.

Methods: authors studied patients affected by voluminous VAs (width >3cm; depth >5mm) referred to the Unit of Odontostomatology Aldo Moro University of Bari from 2018 to 2021. Intraoral and/or extraoral ultrasonography estimated the superficial extension, depth expansion, and type of vessels for all VAs; in addition, all patients underwent magnetic resonance imaging too. The laser treatment employed a diode laser (wavelength 800±10nm) in pulsed mode (t-on 190ms / t-off 250ms) with a quartz fiber (320µm diameter); the transmucosal no-contact photocoagulation delivered 8-12W of power, whereas the intralesional one delivered 13W up to 5mm of depth. External cooling was applied by ice. Follow-up lasted one month postoperatively.

Results: authors studied 5 pediatric and 15 adult patients; all of them had a swallowing impairment due to the VAs; one had a breathing impairment too. Preoperative diagnosis were: 8 angiomas, 2 hemolymphangiomas, 7 telangiectasias, 3 malformations. Both a significant reduction of the lesion volume and improvement of swallowing and breathing were observed at the end of the follow-up.

Conclusions: in our experience, transmucosal and intralesional photocoagulation debulked the voluminous VAs and resolved the related swallowing and breathing issues.

USING THE DIODE LASER AS SNORE THERAPY: TECHNICAL NOTE FOR TWO LASERS WITH DIFFERENT WAVELENGTHS

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Aim: snoring is generated by soft tissue vibration of the upper airway that partially obstructs airflow during sleep. It is a social problem and a potential risk for obstructive sleep apnea (OSAS). The treatment for OSA is CPAP (positive airway pressure). For snoring, there are conservative and surgical options. The photothermal effects of diode lasers are painless and can be used in combination with and in addition to CPAP and MAD (mandibular advancement).

Methods: the most effective photobiomodulation parameters were defined for 2 diode lasers on 2 male adults (1 laser and 1 patient). The risk of OSA was defined by intra and extraoral physical examination and ESS, TSS, and VSS questionnaires. The diode laser is applied in motion to the right and left soft palate, right and left tonsillar pillars, and uvula for 5 minutes at each point, once a week, for 6 weeks. Objective pre and post-operative assessment was obtained with polysomnography. Diode laser (Oralia) Power 20W 810 nm, Frequency 10000Hz, Pulse 1:4 and 20μS Energy 4J, Fiber 800μ. Diode laser (Fisioline) Power 8W 1064nm, 100W 910nm (400mW 650nm continuous), Frequency 30000Hz, Energy 6kJ, Fiber 1000μ.

Results: in the 2 individuals with OSA, photobiomodulation by diode laser was shown to be effective in reducing snoring and other sleep disturbances as measured by ESS, TSS, and VSS questionnaires without significant changes in AHI or RDI.

Conclusions: nonsurgical, minimally invasive treatment with the 2 diode lasers has been shown to have statistically significant efficacy in reducing snoring and many other symptoms of sleep disorders.